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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,008	03/13/2007	Pratibhash Chattopadhyay	FER-15618.001.001	6289
7609 7590 10/28/2008 RANKIN, HILL, & CLARK LLP 925 EUCLID AVENUE, SUITE 700 CLEVELAND, OH 44115-1405				
EXAMINER				
HUDA, SAIED M				
ART UNIT		PAPER NUMBER		
1791				
MAIL DATE		DELIVERY MODE		
10/28/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/552,008

Applicant(s)

CHATTOPADHYAY ET AL.

Examiner

SAEED M. HUDA

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 5-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
- Paper No(s)/Mail Date 11/21/2008
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

- I. Species I requires that the composite is in the form of particles prior to being contacted with the supercritical fluid.
- II. Species II requires that the composite is in the form of a solid matrix when contacted with the supercritical fluid.
- III. Species III requires the composite particle to be in a fluidized bed when contacted with the supercritical fluid.
- IV. Species IV requires the composite particles to be suspended in a solvent that is not soluble in the supercritical fluid when contacted with the supercritical fluid.

Applicant is required, in reply to this action, to elect **one species from species I and II and to elect one species from species III and IV** which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims

are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

2. The claims are deemed to correspond to the species listed above in the following manner:

- a) Species I – Claim 2
- b) Species II – Claim 6
- c) Species III – Claim 4
- d) Species IV – Claim 5

The following claim(s) are generic: no claim is generic.

3. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

Species I and II have mutually exclusive special technical features, namely:

- I. Species I requires that the composite is in the form of particles prior to being contacted with the supercritical fluid.
- II. Species II requires that the composite is in the form of a solid matrix when contacted with the supercritical fluid.

Species III and IV have mutually exclusive special technical features, namely:

- III. Species III requires the composite particle to be in a fluidized bed when contacted with the supercritical fluid.
- IV. Species IV requires the composite particles to be suspended in a solvent that is not soluble in the supercritical fluid when contacted with the supercritical fluid.

4. During a telephone conversation with Attorney Kenneth A. Clark on 09/04/2008 a provisional election was made with traverse to prosecute the invention of species I and

species III. Affirmation of this election must be made by applicant in replying to this Office action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how a claim can be dependent on itself. For examination purposes, The Examiner takes claim 9 to be dependent from claim 2. Additionally, it is unclear what is meant by "volume diameter" in this claim. For examination purposes, The Examiner interprets this phrase to mean volume.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 1-4, 7-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Daitch et al. (US 6447991 B1).

a. With regards to claims 1-4 and 10, Daitch et al. disclose an aerogel material doped with special bioaffinity compounds to providing means of unique collection, detection and identification of bioaerosols, including bacteria, viruses, toxins, and other bioaerosols (abstract). Daitch et al. disclose a method of

regular (non-doped) aerogel production is the sol-gel process where a solution of silicate monomer (sol) undergoes polymerization to a gel, as shown in FIG. 1. Specifically, an ethanol solution of tetraethoxysilane $\text{Si}(\text{OCH}_2\text{CH}_3)_4$ in the presence of water, ethanol, and catalyst, undergoes partial hydrolysis and a condensation reaction to form a sol (a colloidal dispersion of particles in liquid). As the process of polymerization continues, a solid silicate network separates out of the solution (gel point). The solid is still "soaking" in the ethanol solution; this biphasic system is usually referred to as the alcogel. Subsequent removal of the liquid phase from the alcogel by supercritical drying, results in a low density, highly porous silica aerogel (column 3, lines 5-18).

b. With regards to claim 7, Daitch et al. states that bioaerosols, including bacteria, viruses, toxins, and other biological materials generally have a particle size ranging from $0.01\mu\text{m}$ - $10\mu\text{m}$ (column 1, lines 60-67). Volume calculations based, for example, on spherical shapes yields a volume range of 5.23×10^{-7} - 523.60 .

c. With regards to claim 8, Daitch et al. disclose that the "smart aerogel" of the invention has a complex pore structure with discrete ranges from 2nm to 100nm (column 1, lines 62-64). This size range is suitable for administration to a human patient by inhalation.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daitch et al. (US 6447991 B1) as applied to claim 1 above, and further in view of Chattopadhyay et al. (US 2004/0156911).

Daitch et al. disclose the use of a supercritical fluid, as stated in the rejection for claims 1-5 above; however, fail to disclose that the supercritical fluid is carbon dioxide. Chattopadhyay et al. disclose a method for continuously producing particles from an emulsion by supercritical fluid extraction (abstract). Chattopadhyay et al. teach that a supercritical fluid is preferably carbon dioxide ([0055]). It would have been obvious to one skilled in the art at the time of the invention to use carbon dioxide, as disclosed in Chattopadhyay et al., as the supercritical fluid in the invention of Daitch et al. because carbon dioxide is a readily available gas and is less costly to obtain than other gases.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAEED M. HUDA whose telephone number is (571)270-5514. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SAEED M. HUDA/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791